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10/791,382	03/03/2004	Ekaterina Bourova	Q79968	3506

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EXAMINER

DIACOU, ARI M

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3663

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Election/Restrictions

1. Claims 11-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 2-27-2006.

Specification

2. The disclosure is objected to because of the following informalities: In paragraph [0014]: Napierian algorithm → Napierian logarithm.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first two paragraphs of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. The claims are replete with open-ended ranges. While case law has resolved many issues of definiteness with regard to ranges, an open ended range is rarely enabled to the extent claimed by the applicant, and as such conflicts with the enablement requirement of 35 U.S.C. 112, first paragraph. To resolve this conflict, all ranges must be closed-ended.

5. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for some parameters, does not reasonably provide enablement for all parameters within the scope claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

- Regarding claim 1, the specification enables (absorption = 100 dB, Raman efficiency = 0.5 W^{-1}), but does not enable one skilled in the art to make a device that has an absorption of 10000 dB and still has a Raman efficiency $\geq 0.5 \text{ W}^{-1}$.
- Regarding claim 2, the specification enables EDFA gain of 1dB, but does not enable one skilled in the art to make a device that has an EDFA gain of 1000 dB.
- Regarding claim 3, the specification enables a fiber length of 100m, but does not enable one skilled in the art to make or use a device with a fiber length of 10^6 kilometers.
- Regarding claim 4, the specification enables $3 \text{ W}^{-1} \text{ km}^{-1}$, but does not enable one skilled in the art to make a device that has a Raman efficiency of $10000 \text{ W}^{-1} \text{ km}^{-1}$.
- Regarding claim 5, the specification enables an inner radius of 1.5 μm , but from the drawings we are to assume that the inner radius in question is the same as the radius of the single-mode core. The specification therefore does not enable anyone to make a single mode fiber in glass that has a radius of 10 meters.

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- Regarding claim 6, the specification enables a rare earth concentration of 1000 ppm, but does not enable one skilled in the art to make a device that has an absorption of 100 dB with a rare-earth concentration of 1 part per mol.
- Regarding claim 7, the specification enables $n_2 - n_1 = 0.01$, but does not enable one skilled in the art to make a device with a cladding $n_2 - n_1 = 20$.

6. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 does not specify whether the doped ring or the undoped core has an absorption of greater than 100 dB.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (from IDS).

- Regarding claim 1, Lee discloses a doped ring amplifying optical fiber (1) comprising:
 - a single-mode core (10) of given diameter d_1 ; [Fig. 1, “center core”]

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- and a multimode core (20) surrounding the single-mode core and containing a doped layer (21) referred to as a "doped ring", having a certain concentration (c1) of active rare earth ions (6), the fiber being suitable, because of the active rare earth ions, for amplifying an optical signal (s_u) for injection into the amplifying fiber; [Fig. 1, "ring core"]
- *the fiber being characterized in that it is of a length and has Raman efficiency such that the product of said length multiplied by said Raman efficiency is greater than or equal to $0.5 W^{-1}$* , [because the Raman efficiency function is dependent on wavelength, this qualification is a statement of intended use, as it depends on what wavelength of light is put through it]
- and in that, for said fiber presenting absorption for an injected optical signal (s_u) due to the presence of active rare earth ions, said absorption being defined by an absorption coefficient expressed in dB/m and presenting a maximum value as a function of the wavelength of said signal, which value is referred to as the absorption maximum, said fiber presents accumulated absorption, corresponding to the product of said length multiplied by said absorption maximum, which is greater than or equal to 100 dB. [Lee states that the interstage loss was "assumed to be 15dB, multiply by the 20 stages, and the absorption is greater than 100dB]
- Regarding claim 2, Lee discloses an EDFA gain of greater than 1dB [Fig. 3b]

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9. The italicized clauses are essentially method limitations or statements or intended or desired use and are being examined as if the apparatus were capable of performing the functions described in said clauses. The applicant is claiming an apparatus, not a method or process. Thus, these claims as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of the specification. Lee discloses the invention with all the limitations of claim 1, but fails to disclose the diameter of the fiber optic cable used. The specification teaches that making a fiber with an inner core of 7 μm has been achieved [¶ 0005]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to draw a fiber to 7 μm , for the advantage of using methods common in the art.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of Bayart (USPAP No. 2001/0022884). Lee discloses the invention with all the limitations of claim 1, but fails to disclose the rare-earth concentration. Bayart teaches rare earth (including erbium) doping in the range of 100-2000 ppm [¶ 0019]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to dope a fiber with 100-1000 ppm of rare earth element, for the advantage of being within the range enabled by Bayart.

15. Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of Saleh (PTO-892). Lee discloses the invention with all the limitations of claim 1, but fails to disclose the refractive indices of the the two cores. Saleh teaches that the difference between refractive indices is typically between .001 and .02 [Page 275]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to have refractive indices with a difference of .01, for the advantage of cheaper cost of manufacture.

16. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of Saleh (PTO-892). Lee discloses the invention with all the limitations of claim 1, but fails to disclose the single mode core

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radius to be between 3 μm and 5 μm . Saleh teaches that the number of modes is dependent on the radius of the fiber, and further teaches that mode intensity decreases with increasing radius. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to optimize the radius of the core so that it successfully pumped the ring core, for the advantage of enabling the device of Lee.

17. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of Rottwitt (NPL found on PTO-892). Lee discloses the invention with all the limitations of claim 1, but fails to disclose germanium doping of the single mode core. Rottwitt teaches that germanium is typically to alter the refractive index of a silica fiber [¶ 3]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to dope a fiber used in Raman amplification with germanium, for the advantage of changing the refractive index of the fiber.

18. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of Araujo (USP No. 3784386). Lee discloses the invention with all the limitations of claim 1, but fails to disclose doping the RE doped ring with MgO. Araujo teaches that MgO may be used in claddings of fiber optic cables [Abstract]. Therefore, it would have been obvious to one skilled in the art

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(e.g. an optical engineer) at the time the invention was made, to dope the cladding with MgO, for the advantage of having "proper thermal expansion".

Conclusion

19. While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

20. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

21. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 3/8/2006



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